

CLAIMS

1. Process for providing a semiconducting device comprising the steps of:
- depositing a semiconducting layer onto a substrate by means of heating a gas to a predetermined, dissociation temperature so that the gas dissociates into fractions, whereby these fractions subsequently condense on the substrate to build up a semiconducting layer.
2. Process according to claim 1 wherein the gas is heated by heat radiating from a heating element.
3. Process according to claim 2 wherein the heating element comprises a tungsten element.
4. Process according to any of the preceding claims, wherein the carrier is a silicon wafer.
5. Process according to claim 4, wherein the silicon wafer is thermally oxidized.
6. Process according to any of the claims 1-3, wherein the carrier is made of glass.
7. Process according to any of the previous claims, wherein the gas is a silicon containing gas.
8. Process according to claim 7, wherein the silicon containing gas comprises silane.
9. Process according to any of the previous claims wherein the gas is heated to a temperature in the range of 500-3000 °C, preferably 1600-2000 °C and especially in the case of tungsten most preferably to a temperature of about 1750 °C.
10. Process according to any of the previous claims, wherein the substrate is pretreated with a treatment gas before deposition of the semiconducting layer is carried out.
11. Process according to claim 10, wherein the pretreatment gas comprises hydrogen.

12. Process according to any of the preceding claims wherein the substrate is periodically isolated from the heating element, and/or the silicon containing gas, and/or the pretreatment gas.

13. Process according to any of the previous claims, carried out in a vacuum vessel.

14. Process according to any of the previous claims, carried out at a pressure greater than 10^{-6} millibar, preferably at a pressure between 15 and 500 microbar, most preferably at a pressure of 20 microbar.

15. Process according to any of the previous claims, wherein the gas is guided through the vacuum vessel at a rate of between 20 and 150 standard $\text{cm}^3/\text{minute}$ and most preferably with a gas flow of 90 standard $\text{cm}^3/\text{minute}$.

16. Process according to any of the previous claims, wherein the substrate is heated to a temperature of between 200 and 600°C, preferably to a temperature of between 400 and 450°C and most preferably to a temperature of 430°C.

17. Process according to any of the previous claims, wherein following deposition of the semiconducting layer, the device is cooled.

18. Process according to claim 17 wherein the device is cooled by guiding silane gas through the vacuum vessel.

19. Process according to claim 17 or 18, whereafter a highly doped semiconducting layer is deposited on the semiconducting layer.

20. Process according to claim 19, wherein the highly doped semiconducting layer is deposited by means of radiofrequency glow discharge.

21. Process according to claim 20, wherein prior to the deposition of the highly doped semiconducting layer, the surface bonds of the deposited semiconducting layer are passivated, preferably by treating these with H_2 plasma.

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22. Device, in particular being a transistor, said device having a substantially consistent gate voltage and a saturation mobility μ , in the range of about 0.001 to about 100, for example about 0.001 to about 10 and most preferably from about 0.1 to about 1.00 $\text{cm}^2/\text{V.s.}$

23. Device obtainable according to the process according to any of the claims 1-21, which device has a substantially consistent gate voltage and having a saturation mobility in the range of about 0.001 to about 100, for example about 0.001 to about 10 and most preferably from about 0.1 to about 1.00 $\text{cm}^2/\text{V.s.}$

24. Device comprising a substantially exclusive polycrystalline Si:H or a polycrystalline and amorphous Si:H layer, said device having a substantially consistent gate voltage and a saturation mobility lying in the range of about 0.001-1000, for example 0.001 to 500 $\text{cm}^2/\text{V.s.}$

25. Vacuum chamber for carrying out the process according to any of the claims 1-21, comprising a gas inlet, a gas outlet, a gas heating element, and a substrate heater.

26. Vacuum chamber according to claim 24, further comprising a shutter element arrangeable between the gas heating element and a substrate.

27. Vacuum chamber according to claim 25 or 26, further comprising a radiofrequency electrode for plasma enhanced chemical vapor deposition.

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